

## **Cloud cover (cloud amount)**

The total amount of cloud should be estimated by considering how much of the apparent area of the sky is covered by cloud. In determining the amount of cloud of a specified form or type present, the observer should estimate, by taking into consideration the evolution of the sky, the cloud amounts of each layer or mass at the different levels as if no other clouds were present.

Care should be taken to avoid unconsidered guessing and the best safeguard against this is a knowledge of the evolution of the clouds under consideration. On occasions of fog which is so thick as to make it impossible to tell whether there is cloud above or not, the state of sky should be recorded as sky obscured. If the cloud can be seen through the fog, the cloud amount should be estimated as well as circumstances permit. If the sun, moon, or stars can be seen through the fog and there is no evidence of cloud above the fog, the state of the sky should be recorded as clear.

At night the observation of total cloud amount is noted by observing which stars are showing and which are obscured. It is more difficult to differentiate between low, middle, and high clouds and a reliable observation depends upon the degree of illumination and the experience of the observer.

## **Cloud height advice**

This program computes a (base of lowest) cloud height advice if cloud classification, latitude, air temperature, wet-bulb temperature (or dew-point) and present weather are available (note: sometimes not all parameters required). This advice can always be over-ruled by checking another button.

## Cloud height estimation

In the absence of instrumental aids, the cloud-base height must be estimated. In order to improve their ability to do this, observers should be encouraged to take every opportunity of checking their estimates against known heights, e.g., when a cloud base is seen to intercept a mountainous coast (although in such circumstances the cloud base may be lower at the mountain than at sea). At stations where the observer has reports available from aircraft descending or ascending in the vicinity, he can relate these to what he sees and so provide reports sufficiently reliable for meteorological purposes. At other stations estimates can sometimes be widely in error.

As a rough guide, the heights of the bases of the various types may be expected to be between the following limits:

### *Low Clouds (Cl)*

Stratus: usually below 600 m (2000 ft) and sometimes nearly down to the surface.

Cumulonimbus: 600 - 1500 m (2000 - 5000 ft).

Stratocumulus: 450 - 1350 m (1500 - 4500 ft).

Cumulus: 450 - 1500 m (1500 - 5000 ft).

### *Middle Clouds (Cm)*

Nimbostratus: 150 - 2000 m (500 - 6500 ft), usually below 600 m (2000 ft) in moderate rain or snow.

Altostratus and Altocumulus: 2000 - 5500 m (6500 - 18000 ft).

### *High Clouds (Ch)*

usually above 5500 m (18000 ft).

### Note

- These limits tend to be considerably higher in low latitudes; this applies particularly to high clouds.

## **Marine observers Handbook**

### *Cloud cover (cloud amount)*

The amount of cloud was in the past estimated as the number of tenths of sky covered. At a conference of the International Meteorological Organization (Washington 1947) it was recommended that amount of cloud be reported in eighths instead of tenths. This change of procedure was brought into force with the introduction of the revised International Code (Washington) on 1 January 1949. In making the observation it is necessary to stand in a position affording an uninterrupted view of the whole sky. To make an estimate for the whole sky at once requires practice and is rather difficult at first. It is convenient to imagine the sky divided into quadrants by two arcs drawn at right angles through the zenith.

Each quadrant represents two-eighths of the total sky. If we choose the most appropriate of the figures –

- 0 = Clear or almost clear of cloud
- 1 = About half covered
- 2 = Completely or almost completely covered with cloud –

for each separate quadrant, then the total amount of cloud for the whole sky is obtained simply by adding the amounts in the separate quadrants.

At night, the observation of total cloud amount is noted by observing which stars are showing and which are obscured. It is more difficult to differentiate between low, middle, and high clouds and reliable observation depends upon the degree of illumination and the experience of the observer.

### *Cloud height*

Apart from some special ships, cloud height at sea is obtained by estimation. The first step in estimating cloud height consists of identifying the cloud as a type belonging to one of the three classes, low, medium, or high. Low clouds have their bases below 6500 feet (2000 m). Medium cloud layers usually occur at levels between 6500 and 18 000 feet (2000 and 5500 m), and high clouds are usually above 18 000 feet (5500 m). As a rough guide, the heights of the bases of the various types of low cloud may be expected to be between the following limits:

Stratus	Usually below 2000 feet (600 m) and sometimes nearly down to the surface.
Nimbostratus	500 to 4000 feet (150 to 1200 m) usually below 2000 feet (600 m) in moderate rain or snow.
Cumulonimbus	2000 to 5000 feet (600 to 1500 m).
Stratocumulus	1500 to 4500 feet (450 to 1350 m).
Cumulus	1500 to 5000 feet (450 to 1500 m).

These limits tend to be considerably higher in low latitudes; this applies particularly to high clouds.

It is difficult to estimate cloud height without much practice. The apparent size of the cloud elements is often an indication of height. For example, the lower the height of the individual cloudlets of an altocumulus layer, the larger they will normally appear. Layers having the appearance of altocumulus with large individual elements are often found at heights between 6000 feet (1800 m) and 10 000 feet (3000 m). The estimation of the height of stratified cloud, e.g., altostratus or nimbostratus, is particularly difficult. The lack of pronounced structure makes it easy to gain a false impression of height. Valuable experience can be gained on occasions when the observer knows that his ship is steaming towards a depression by watching the gradual lowering of the cloud base. The observer's impressions of the appearance of the sky in the successive stages of lowering will assist his judgement on future occasions. It is only by such experience that an observer can distinguish between a layer of nimbostratus in the lower middle band and a similar layer at, perhaps, only 2000 to 3000 feet (600 to 900 m).

Care must be taken before using the apparent speed of cloud as an index to its height. This apparent speed depends not only on the velocity of the wind at cloud level but also on the course and speed of the ship itself.

When coasting, cloud height may sometimes be estimated by comparison with the height of the mountains or hills in the background. In using this method, however, it should be remembered that cloud is usually lower over the hills than elsewhere and that it is the general level over the sea that is required.